

July 20, 2016



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July 19, 2016

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHPRC SAF X16-005
Work Order: 400027
SDG: GEL400027

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 24, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071ES20 - 7H
Chain of Custody: X16-005-164
Enclosures



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Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X16-005
SDG: GEL400027

July 19, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 24, 2016, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER.

Sample Identification

The laboratory received the following sample:

<u>Laboratory Identification</u>	<u>Sample Description</u>
400027001	B34WV6

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile.

We certify that this package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

July 20, 2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

July 20, 2016

**GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400027
Work Order #: 400027**

Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Blank (MB) Statement

Target analytes were detected in the blank 1203575153 (MB) below the reporting limit.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203575155 (Non SDG 400025001PS)	2-Butanone	62* (70%-130%)
	Acetone	48* (70%-130%)
1203575156 (Non SDG 400025001PSD)	2-Butanone	67* (70%-130%)
	Acetone	53* (70%-130%)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

July 20, 2016

CH2M Hill Plateau Remediation Company		C.O.C. # X16-005-164	
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			
Collector Juan Aguilar CHPRC		Telephone No. 376-4650	
SAF No. X16-005		Purchase Order/Charge Code 300071	
Project Title GW Sitewide Surv, FY16		Ice Chest No. CWS-487	
Shipped To (Lab) GEL Laboratories, LLC		Bill of Lading/Air Bill No. 177659386 1877	
Protocol SURV		Offsite Property No. 60767	
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Special Instructions Batch with A, I, S, and W SAFs.		Hold Time	
Priority: 30 Days		SPECIAL INSTRUCTIONS	
Contact/Requester WATERS-HUSTED, K		Sample Analysis	
Sampling Origin Hanford Site		Holding Time	
Logbook No. HNF-N-506 85 / 81		14 Days	
Method of Shipment Commercial Carrier		Preservative	
HCL or H2SO4 to pH <2/Cool <=6C			
Sample No.	Filter	Date	Time
B34WV6	N	WJUN 23 2016	0922
No/Type Container	4x40-mL aGs*		

400027

Relinquished By Juan Aguilar CHPRC	Print CHPRC	Sign	Date/Time JUN 23 2016 1040
Received By Janelle Zunker CHPRC	Print CHPRC	Sign	Date/Time JUN 23 2016 1040
Relinquished By Janelle Zunker CHPRC	Print CHPRC	Sign	Date/Time JUN 23 2016 1400
Received By FEDEX	Print FEDEX	Sign	Date/Time JUN 23 2016 1400
Relinquished By Fed Ex	Print Fed Ex	Sign	Date/Time JUN 23 2016 1400
Received By M. K. Shaw	Print M. K. Shaw	Sign	Date/Time 6-24-16 0900
Relinquished By	Print	Sign	Date/Time
Matrix *			
S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other
Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Date/Time	
PRINTED ON 3/16/2016		A-6004-842 (REV 2)	

July 20, 2016



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPLC</u>		SDG/AR/COC/Work Order: <u>400027</u>
Received By: <u>MK</u>		Date Received: <u>6-24-16</u>
Suspected Hazard Information	Yes	No
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

Maximum Net Counts Observed* (Observed Counts - Area Background Counts): cpm

If yes, Were swipes taken of sample containers < action levels?

If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.

Hazard Class Shipped: UN#:

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>135462962</u> Secondary Temperature Device Serial # (if Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15 COC form is properly signed in-relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7765 9386 1877 2^c</u> <u>7765 9528 2194 2^c</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS

Date 6/24/16

Page 1 of 1

GL-CHL-SR-001 Rev 3

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 19 July 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400027
Work Order #: 400027

Product: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW846 8260C

Analytical Procedure: GL-OA-E-038 REV# 22

Analytical Batch: 1577534

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400027001	B34WV6
1203575153	Method Blank (MB)
1203575154	Laboratory Control Sample (LCS)
1203575155	400025001(NonSDG) Post Spike (PS)
1203575156	400025001(NonSDG) Post Spike Duplicate (PSD)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Blank (MB) Statement

Target analytes were detected in the blank 1203575153 (MB) below the reporting limit.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203575155 (Non SDG 400025001PS)	2-Butanone	62* (70%-130%)
	Acetone	48* (70%-130%)
1203575156 (Non SDG 400025001PSD)	2-Butanone	67* (70%-130%)
	Acetone	53* (70%-130%)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400027 GEL Work Order: 400027

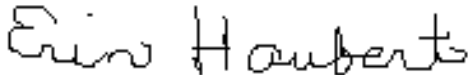
The Qualifiers in this report are defined as follows:

- B The analyte was detected in both the associated QC blank and in the sample.
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Erin Haubert

Date: 19 JUL 2016

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL400027

Lab Sample ID: 400027001

Date Collected: 06/23/2016 09:22

Date Received: 06/24/2016 09:00

Matrix: WATER

Client ID: B34WV6

Batch ID: 1577534

Run Date: 06/27/2016 14:01

Prep Date: 06/27/2016 14:01

Data File: 062716V3\3P110.D

Client: CPRC001

Method: SW846 8260C

Inst: VOA3.I

Analyst: CDS1

Project: CPRC0X16005

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	B	5.27	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Quality Control Summary

July 20, 2016

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 19, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400027

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1577534										
QC1203575154	LCS										
1,1,1-Trichloroethane	50.0			50.7	ug/L		101	(70%-130%)	CDS1	06/27/16	10:28
1,1,2-Trichloroethane	50.0			49.4	ug/L		99	(70%-130%)			
1,1-Dichloroethane	50.0			50.3	ug/L		101	(70%-130%)			
1,1-Dichloroethylene	50.0			51.1	ug/L		102	(70%-130%)			
1,2-Dichloroethane	50.0			46.9	ug/L		94	(70%-130%)			
2-Butanone	250			247	ug/L		99	(70%-130%)			
4-Methyl-2-pentanone	250			217	ug/L		87	(70%-130%)			
Acetone	250			246	ug/L		99	(70%-130%)			
Benzene	50.0			49.0	ug/L		98	(70%-130%)			
Carbon disulfide	250			245	ug/L		98	(70%-130%)			
Carbon tetrachloride	50.0			48.7	ug/L		97	(70%-130%)			
Chlorobenzene	50.0			50.4	ug/L		101	(70%-130%)			
Chloroform	50.0			48.2	ug/L		96	(70%-130%)			
Ethylbenzene	50.0			49.0	ug/L		98	(70%-130%)			
Methylene chloride	50.0		B	53.8	ug/L		108	(70%-130%)			
Tetrachloroethylene	50.0			49.9	ug/L		100	(70%-130%)			
Toluene	50.0			49.5	ug/L		99	(70%-130%)			
Trichloroethylene	50.0			49.7	ug/L		99	(70%-130%)			
Vinyl chloride	50.0			48.7	ug/L		97	(70%-130%)			
Xylenes (total)	150			146	ug/L		97	(70%-130%)			

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July 20, 2016

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 400027

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1577534										
**1,2-Dichloroethane-d4	50.0			48.1	ug/L		96	(70%-130%)	CDS1	06/27/16	10:28
**Bromofluorobenzene	50.0			51.4	ug/L		103	(70%-130%)			
**Toluene-d8	50.0			49.9	ug/L		100	(70%-130%)			
QC1203575153 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					06/27/16	11:29
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			J	2.44	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						

July 20, 2016

GEL LABORATORIES LLC

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QC Summary

Workorder: 400027

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1577534										
Vinyl chloride			U	0.300	ug/L				CDS1	06/27/16	11:29
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.5	ug/L		103	(70%-130%)			
**Bromofluorobenzene	50.0			49.6	ug/L		99	(70%-130%)			
**Toluene-d8	50.0			51.6	ug/L		103	(70%-130%)			
QC1203575155 400025001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	51.7	ug/L		103	(70%-130%)		06/27/16	18:04
1,1,2-Trichloroethane	50.0	U	0.00	46.9	ug/L		94	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	48.1	ug/L		96	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	48.3	ug/L		97	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	46.2	ug/L		92	(70%-130%)			
2-Butanone	250	TU	0.00 T	155	ug/L		62 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	208	ug/L		83	(70%-130%)			
Acetone	250	TU	0.00 T	119	ug/L		48 *	(70%-130%)			
Benzene	50.0	U	0.00	48.4	ug/L		97	(70%-130%)			
Carbon disulfide	250	U	0.00	235	ug/L		94	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	48.4	ug/L		97	(70%-130%)			
Chlorobenzene	50.0	U	0.00	48.6	ug/L		97	(70%-130%)			
Chloroform	50.0	J	0.360	47.7	ug/L		95	(70%-130%)			
Ethylbenzene	50.0	U	0.00	48.0	ug/L		96	(70%-130%)			
Methylene chloride	50.0	U	0.00 B	49.2	ug/L		98	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	48.0	ug/L		96	(70%-130%)			

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QC Summary

Workorder: 400027

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1577534										
Toluene	50.0	U	0.00	48.1	ug/L		96	(70%-130%)	CDS1	06/27/16	18:04
Trichloroethylene	50.0	J	4.47	51.6	ug/L		94	(70%-130%)			
Vinyl chloride	50.0	U	0.00	36.5	ug/L		73	(70%-130%)			
Xylenes (total)	150	U	0.00	141	ug/L		94	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		58.1	47.6	ug/L		95	(70%-130%)			
**Bromofluorobenzene	50.0		48.8	48.0	ug/L		96	(70%-130%)			
**Toluene-d8	50.0		55.8	48.9	ug/L		98	(70%-130%)			
QC1203575156 400025001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	55.5	ug/L	7	111	(0%-20%)		06/27/16	18:34
1,1,2-Trichloroethane	50.0	U	0.00	49.3	ug/L	5	99	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	51.6	ug/L	7	103	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	52.0	ug/L	8	104	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	47.1	ug/L	2	94	(0%-20%)			
2-Butanone	250	TU	0.00 T	168	ug/L	8	67 *	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	220	ug/L	5	88	(0%-20%)			
Acetone	250	TU	0.00 T	132	ug/L	10	53 *	(0%-20%)			
Benzene	50.0	U	0.00	51.7	ug/L	7	103	(0%-20%)			
Carbon disulfide	250	U	0.00	246	ug/L	4	98	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00	52.0	ug/L	7	104	(0%-20%)			
Chlorobenzene	50.0	U	0.00	51.1	ug/L	5	102	(0%-20%)			
Chloroform	50.0	J	0.360	50.0	ug/L	5	99	(0%-20%)			
Ethylbenzene	50.0	U	0.00	50.7	ug/L	6	101	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1577534										
Methylene chloride	50.0	U	0.00	B	48.7	ug/L	1	97	(0%-20%)	CDS1	06/27/16 18:34
Tetrachloroethylene	50.0	U	0.00		51.0	ug/L	6	102	(0%-20%)		
Toluene	50.0	U	0.00		50.3	ug/L	4	101	(0%-20%)		
Trichloroethylene	50.0	J	4.47		55.3	ug/L	7	102	(0%-20%)		
Vinyl chloride	50.0	U	0.00		38.2	ug/L	4	76	(0%-20%)		
Xylenes (total)	150	U	0.00		152	ug/L	7	101	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		58.1		50.3	ug/L		101	(70%-130%)		
**Bromofluorobenzene	50.0		48.8		53.9	ug/L		108	(70%-130%)		
**Toluene-d8	50.0		55.8		51.2	ug/L		102	(70%-130%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Volatile
Surrogate Recovery Report

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SDG Number: GEL400027

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203575154	LCS for batch 1577534	96	100	103
1203575153	MB for batch 1577534	103	103	99
400027001	B34WV6	112	108	96
1203575155	B35M74PS	95	98	96
1203575156	B35M74PSD	101	102	108

Surrogate

Acceptance Limits

DCED4	= 1,2-Dichloroethane-d4	(70%-130%)
TOL	= Toluene-d8	(70%-130%)
BFB	= Bromofluorobenzene	(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted